

WHAT IS CLAIMED IS:

- Sub
Ab
1. A combined absolute and differential pressure transducer, comprising:
first and second sensors each having a piezoresistive structure thereon and responsive to an applied force to produce an output according to the magnitude of said applied force, each of said sensors fabricated from a common wafer process to enable said sensors to be matched in regard to thermal properties, said first sensor having a cover member and operative to receive a first force to provide an absolute pressure output, said second sensor having a cover member having a port aperture therein to enable said second sensor to receive said first force as applied to said first sensor and a second force applied via said aperture to provide a differential output pressure, said first and second sensors having substantially an equal web thickness and a different active area.
 2. The combined absolute differential pressure transducer according to claim 1 wherein, said first and second sensors are included on separate substrates obtained from a common wafer with common processing.
 3. The combined absolute differential pressure transducer according to claim 1 wherein said first and second sensors are located on the same substrate having a common cover member.

BEST AVAILABLE COPY

4. The combined absolute differential pressure transducer according to claim 1 wherein the active area of said differential sensor is larger than the active area of said absolute sensor.
5. The combined absolute differential pressure transducer according to claim 1 wherein the active area of said absolute sensor is larger than the active area of said differential sensor.
6. The combined absolute differential pressure transducer according to claim 1 wherein said first and second sensors include:
 - a semiconductor diaphragm member having a top surface coated with an oxide layer,
 - P+ sensors fusion bonded to said oxide layer at a relatively central area of said diaphragm,
 - P+ finger elements fusion bonded to said oxide layer extending from said sensors to an outer contact location of said diaphragm for each finger,
 - an external rim of P+ material fusion bonded and surrounding said sensors and fingers,
 - a glass cover member electrostatically bonded to said fingers and rim to hermetically seal said sensors and fingers of said diaphragm member, said glass cover having a depression above said sensors and having a plurality of apertures, each aperture associated with a separate

BEST AVAILABLE COPY

finger at said contact location wherein each contact location can be accessed via said associated aperture in said glass cover.

7. The combined absolute and differential pressure transducer according to claim 6 further including another aperture located in said glass cover of said differential transducer to enable a second force to be applied to said diaphragm.
8. The combined absolute and differential pressure transducer according to claim 6 including a non-fired conductive glass frit mixture having gold particles located in said apertures in contact with said contact locations.
9. The combined absolute and differential pressure transducer according to claim 1 wherein said first and second sensors are housed in a common header.
10. The combined absolute and differential pressure transducer according to claim 1 wherein said glass cover member is fabricated from PYREX.
11. The combined absolute and differential pressure transducer according to claim 1 wherein each wafer is of the same geometry.

BEST AVAILABLE COPY

12. The combined absolute and differential pressure transducer according to claim 11 wherein each wafer is square.
13. The combined absolute and differential pressure transducer according to claim 1 wherein said first and second sensors are fabricated on a single chip having located thereon an absolute sensor pattern followed by a differential sensor pattern.
14. The combined absolute and differential pressure transducer according to claim 1 wherein said header is fabricated from an iron-nickel-cobalt alloy.
15. The combined absolute and differential pressure transducer according to claim 1 wherein said first and second sensors are fabricated from silicon and said cover numbers are fabricated from glass.
16. The combined absolute and differential pressure transducer according to claim 1 wherein said piezoresistive structures are dielectrically isolated piezoresistive elements forming a Wheatstone bridge array.
17. The combined absolute and differential pressure transducer according to claim 16 wherein said piezoresistive elements are P+ silicon elements.

BEST AVAILABLE COPY

18. The combined absolute and differential pressure transducer according to claim 17 wherein said dielectric material is silicon dioxide.
19. The combined absolute and differential pressure transducer according to claim 6 wherein each wafer is approximately 100 x 100 mils with circular contact apertures each approximately 10 mils in diameter.
20. The combined absolute and differential pressure transducer according to claim 6 wherein each contact area includes a centrally located area of platinum-titanium metalization.

BEST AVAILABLE COPY